

## REMARKS

### I. Status of the Claims

Claims 1, 3, 5, and 17 are pending in the application. Claims 2, 4, 6-16 and 18 have been canceled. Claims 1 and 17 have been amended to more clearly recite features that are patentable over the prior art. No new matter has been added. Reconsideration of the amended claims in light of these Remarks is respectfully requested

### II. Rejection Under 35 U.S.C. § 112, First Paragraph

The Examiner objected to the limitation “at least 5 hours.” The rejection is moot, as this phrase has been deleted. Reconsideration and withdrawal of the rejection are respectfully requested. It is noted, however, that at least Example 7 at page 44 of the specification teaches a step lasting greater than 5 hours (150 hours).

### III. Rejection Under 5 U.S.C. § 112, Second Paragraph

The rejection of claim 18 under 35 U.S.C. § 112, second paragraph, is moot in view of the cancellation of claim 18. The subject matter of claim 18, pertaining to the crystallization of tin oxide in a pore wall of the mesostructured film has been incorporated into the independent claims. The independent claims clarify that crystallization occurs in the step of retaining the substrate in the atmosphere having a relative humidity from 70% to 100%.

Reconsideration and withdrawal of the rejection are respectfully requested.

### IV. Rejection Under 35 U.S.C. § 103(a)

Claims 1, 3, 5, 17, and 18 were rejected over a combination of Stucky, Crepaldi Imai, and Miyata. To the extent the rejection is deemed to apply to the amended claims, reconsideration is respectfully requested.

Independent claims 1 and 17 have been amended to recite that tin oxide is crystallized in a pore wall during of the step of retaining the substrate in an atmosphere having a relative humidity from 70% to 100%. As noted in the specification, this is important in light of the fact that a mesostructured film containing crystallized tin oxide is expected to have conductivity. The amendment is supported in the specification at least at page 29, lines 8-12.

Imai does not teach crystallization of a tin oxide film in the pore of a mesostructure, or that the formation of such a film is merely a “result effective variable.” The experiments described in Imai are conducted with SiO<sub>2</sub> and TiO<sub>2</sub>. Imai, like any other reference applied in an obviousness rejection under 35 U.S.C. § 103(a), may be relied upon for what it teaches one of ordinary skill in the art. MPEP 2124, citing *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989) In this case, the Office Action relies on Imai to teach that “it is well known in the art that treating dried sol-gel derived films in high humidity environments influences and induces structural change and crystallization in the film,” but the reference itself does not draw such a general conclusion. Rather, Imai states that: “the structure and properties of the sol-gel films exposed to water vapor have not been clarified.” The experiments in Imai are conducted with SiO<sub>2</sub> and TiO<sub>2</sub>, so that one of ordinary skill in the art having the full benefit of the Imai reference could have concluded anything about crystallization of tin oxide film in the pores of mesostructure, much less could such person of ordinary skill have established humidity as a result effective variable in the crystallization of such films.

MPEP 2144.05 states that it is not obvious to “optimize” a variable unless the variable is associated with a recognized result. In this case, there is insufficient information in the prior art about the effect of humidity on the crystallization of tin oxide to conclude that a step

of retaining the substrate in an atmosphere of 70-100% relative humidity would have been obvious.

Stucky is likewise inadequate to teach a step of crystallizing tin oxide in the pore of a mesostructure with a step of retaining the substrate in the atmosphere having a relative humidity from 70% to 100%. First, the Office Action correctly states that Stucky does not explicitly teach forming a mesostructured film at a temperature of 100°C or less at 70-100% humidity. Moreover, Stucky does not describe crystallization of a tin oxide film. Such general statements in Stucky about modifying process parameters, as found at page 46 lines 5-13, also do not pertain to crystalline tin oxide film specifically. These general statements, taken alone or in combination with the other prior art applied, do not establish a “result effective variable,” and they do not establish that the step of retaining a substrate in an atmosphere having a relative humidity from 70% to 100% would have been obvious in the context of forming crystalline tin oxide in the pore of a mesostructure.

Crepaldi likewise does not teach crystallization of tin oxide in a pore of a mesostructure and provides no basis to modify Stucky and/or Imai to form a tin oxide crystal film with the process conditions stated in the present claims. In fact, Crepaldi illustrates that humidity is not a “result effective variable” in the formation of a film. In the example, working with zirconia, the treatment of a film with high humidity for a short time (5-10s) resulted in the incorporation of water, which was then followed by drying (p. 1583, col. 1) to obtain a film. This does not establish that the humidity is used in the step of ordering the film structure. In contrast, the claimed step of retaining the substrate in a water vapor containing atmosphere having a relative humidity from 70%-100% is conducted to improve regularity of a mesostructure of the film. In summary, Crepaldi neither teaches crystallization of tin oxide, nor

establishes the claimed step as a result that could be achieved by optimization of a “result effective variable.”

Miyata does not mention crystallization or the formation of tin oxide crystal, and does not overcome the deficiencies of Imai, Stucky and Crepaldi discussed above. None of the references, alone or in combination, discloses or renders obvious the claimed invention.

Reconsideration and withdrawal of the rejection are respectfully requested.

### **CONCLUSION**

Allowance of the claims and passage of the application to issue are respectfully requested.

Applicant’s undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should be directed to our address listed below.

Respectfully submitted,

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